

OAK RIDGE - Pollution

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LWA 900723.0070
September 10,
1984

CL
H.A.D.

Addressees- Letter dated SEP 10 1984

SUBJECT: OAK RIDGE ENVIRONMENTAL DATA -- AUGUST 1984

Mr. Arthur G. Linton
Office of Asst. Regional Administrator
for Policy and Management
U. S. Environmental Protection Agency
Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Mr. Aubrey D. McKinney, Manager
Knoxville Basin Office
State of Tennessee
East Tennessee Regional Office
Department of Health and Environment
Division of Water Management
1522 Cherokee Trail
Knoxville, Tennessee 37920

Mr. M. Lyle Lacy III
City Manager
City of Oak Ridge
Municipal Building
Oak Ridge, Tennessee 37830

Mr. Jack Milligan
Water Quality Control Branch
Tennessee Valley Authority
401 Building
Chattanooga, Tennessee 37401

OAK RIDGE PUBLIC LIBRARY
Civic Center
Oak Ridge, TN 37830



Department of Energy

Oak Ridge Operations

P. O. Box E

Oak Ridge, Tennessee 37831

September 10, 1984

Those on Attached List

Gentlemen:

OAK RIDGE ENVIRONMENTAL DATA -- AUGUST 1984

Additional mercury data have been generated for the Oak Ridge Area and are enclosed for your information and use.

During this reporting period, 157 soil samples were collected from 14 residences with 72 of these samples exceeding the State soil mercury guidelines of 12 ppm. The soil samples exceeding the State guidelines were found on three properties, with 67 samples showing elevated mercury values collected on a single property located in the floodplain of East Fork Poplar Creek. The soil mercury concentrations on this floodplain property ranged from less than 1 ppm to over 2,000 ppm. Several vegetation samples were also collected and analyzed. These included tomatoes, peppers, squash, and cucumbers from private gardens, as well as several native plants on the floodplain. The floodplain vegetation ranged from 220 ppb - 510 ppb mercury. The normal range for mercury in vegetation is 1-123 ppb.

This month's report also shows the decline in Co-60 and Cs-137 in the City's sewage sludge (Figure 1), low levels of radioactivity in sewage at the Emory Valley Road Pump Station (Table 1), multi-element analysis of several soil samples from property No. 564 on the East Fork Poplar Creek floodplain (Table 3), East Fork Poplar Creek soil and plant multi-element analysis and concentration factors (Table 4), a comparison between ORAU and TVA mercury in floodplain soil samples taken by ORNL and TVA as part of the interagency Oak Ridge Task Force Study (Table 5), a summary of quality assurance comparisons of the analytical results of neutron activation and vapor atomic absorption (Table 6), and a comparison of mercury analyses made approximately one year apart on selected 1983 soil samples (Table 7).

September 10, 1984

Property #564 and the DOE property behind the Atmospheric Diffusion and Turbulence Laboratory on Illinois Avenue (See Table 5) are the only properties to show mercury levels exceeding 1000 ppm. Property #564 has now been systematically sampled and these higher mercury in soil concentrations are limited to an area of approximately six feet by six feet. The ADTL property will be systematically sampled in the near future. Both properties are undeveloped where the mercury levels are elevated. Property No. 564 is partially fenced and covered with dense vegetation and trees.

If there are any questions related to this information, please contact me at (615) 576-1256 or (FTS 626-1256).

Sincerely,



Wayne Hibbitts
Office of Assistant Manager
for Safety and Environment

SE-30:Hibbitts

Enclosure:

As Stated

cc w/Encl.:
Oak Ridge Library
R. B. Nicholas, Cong. Staff
J. V. Dugan, Cong. Staff
J. L. Leonard, TN/DHE
Pat Turri, TN/DHE

cc w/o Encl.:
H. D. Zeller, EPA-IV
T. K. Cothron, TN/DHE

MERCURY

**ENVIRONMENTAL SURVEILLANCE AND MONITORING PROGRAM
OAK RIDGE ASSOCIATED UNIVERSITIES**

August 31, 1984

**Report Submitted By
Clayton S. Gist, Certified Senior Ecologist
ORAU-MERT-PTP**

MERCURY DATA

Country Club Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u>			
Grandcove Lane surface	07/18/84	84-1441	11. ppm
Grandcove Lane surface	07/18/84	84-1442	19. ppm
Grandcove Lane surface	07/18/84	84-1443	51. ppm
Grandcove Lane surface	07/18/84	84-1444	11. ppm
Grandcove Lane surface	07/18/84	84-1445	5.8 ppm
Grandcove Lane surface	07/18/84	84-1446	11. ppm
Grandcove Lane surface	07/18/84	84-1447	22. ppm
Grandcove Lane surface	07/17/84	84-1448	7.0 ppm
Grandcove Lane surface	07/25/84	84-1454	.66 ppm
Grandcove Lane surface	07/25/84	84-1456	1.4 ppm
Grandcove Lane surface	07/25/84	84-1457	1.9 ppm
<u>VEGETATION</u>			
Grandcove Lane tomato	07/25/84	84-1455	13. ppb

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables	1-123 ppb
Soils	.01-4.7 ppm
Fresh Water	.02-.06 ppb

MERCURY DATA

East Village Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u>			
Enfield Lane surface	07/19/84	84-1449	.18 ppm
Enfield Lane surface	07/19/84	84-1451	1.2 ppm
<u>VEGETATION</u>			
Enfield Lane white cabbage	07/19/84	84-1450	16. ppb

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables 1-123 ppb
Soils .01-4.7 ppm
Fresh water .02-.06 ppb

August 31, 1984

MERCURY DATA

Elm Grove Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u>			
Thornton Road surface	07/19/84	84-1452	.78 ppm
Thornton Road surface	07/19/84	84-1453	.64 ppm

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables 1-123 ppb
Soils .01-4.7 ppm
Fresh water .02-.06 ppb

MERCURY DATA

Fairbanks Road Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u>			
Amanda Drive surface	08/14/84	84-1569	.06 ppm
Amanda Drive surface	08/14/84	84-1571	.05 ppm
Amanda Drive surface	08/14/84	84-1572	.08 ppm
Amanda Drive surface	08/14/84	84-1574	.06 ppm
<u>VEGETATION</u>			
Amanda Drive tomato	08/14/84	84-1570	31. ppb
Amanda Drive tomato	08/14/84	84-1573	32. ppb

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables	1-123 ppb
Soils	.01-4.7 ppm
Fresh water	.02-.06 ppb

MERCURY DATA

Government Land Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>ANIMAL</u>			
East Boundary Road 2.5 miles from gate - turtle	06/22/83	83-0103-A	140. ppb
East Boundary Road 2.5 miles from gate - turtle	06/22/83	83-0103-B	5000. ppb
East Boundary Road 0.8 miles from gate - turtle	06/22/83	83-0104-A	1.9 ppb
East Boundary Road 0.8 miles from gate - turtle	06/22/83	83-0104-B	5100. ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/06/83	83-0718A-A	.20 ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/06/83	83-0718-B	72. ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/06/83	83-0719-A	2.7 ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/06/83	83-0719-B	120. ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/06/83	83-0720-A	300. ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/06/83	83-0720-B	570. ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/07/83	83-1433-A	160. ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/07/83	83-1433-B	440. ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/07/83	83-1434-A	110. ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/07/83	83-1434-B	910. ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/07/83	83-1435-A	270. ppb
Confluence of East Fork Poplar Creek & Poplar Creek - turtle	10/07/83	83-1435-B	490. ppb

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables	1-123 ppb
Soils	.01-4.7 ppm
Fresh water	.02-.06 ppb

MERCURY DATA

Linden School Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u>			
West Lincoln Road (60,0) surface	07/17/84	84-1412	.12 ppm
West Lincoln Road (60,10) surface	07/17/84	84-1413	.11 ppm
West Lincoln Road (60,20) surface	07/17/84	84-1414	.18 ppm
West Lincoln Road (60,30) surface	07/17/84	84-1415	.22 ppm
West Lincoln Road (60,40) surface	07/17/84	84-1416	.20 ppm
West Lincoln Road (60,50) surface	07/17/84	84-1417	.24 ppm
West Lincoln Road (61,0) surface	07/17/84	84-1418	.23 ppm
West Lincoln Road (61,30) surface	07/17/84	84-1419	.22 ppm
West Lincoln Road (54,27) surface	07/17/84	84-1420	.16 ppm
West Lincoln Road (54,22) surface	07/17/84	84-1421	.19 ppm
West Lincoln Road (47,16) surface	07/17/84	84-1423	.13 ppm
West Lincoln Road (54,37) surface	07/17/84	84-1436	.21 ppm
Lind Place surface	07/26/84	84-1458	.19 ppm
Lind Place surface	07/26/84	84-1459	.18 ppm
Lind Place surface	07/26/84	84-1461	.13 ppm
Lind Place surface	07/26/84	84-1463	.25 ppm
Lind Place surface	07/26/84	84-1465	.31 ppm
Lind Place surface	07/26/84	84-1467	.26 ppm
Lind Place surface	07/27/84	84-1479	.31 ppm
Lind Place surface	07/27/84	84-1480	.19 ppm
Lind Place surface	07/27/84	84-1481	.26 ppm
Lind Place surface	07/27/84	84-1482	.15 ppm
Lind Place surface	07/27/84	84-1483	.17 ppm

MERCURY DATA

Linden School Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL (Continued)</u>			
Lind Place surface	07/27/84	84-1484	.14 ppm
Lind Place surface	07/27/84	84-1485	.14 ppm
Lind Place surface	07/27/84	84-1486	.17 ppm
Lind Place surface	07/27/84	84-1487	.13 ppm
Lind Place surface	07/27/84	84-1488	.24 ppm
Lind Place surface	07/27/84	84-1489	.14 ppm
Lind Place surface	07/27/84	84-1490	.18 ppm
Lind Place surface	07/27/84	84-1492	.26 ppm
Lind Place surface	07/27/84	84-1495	.22 ppm
Lind Place surface	07/27/84	84-1498	.24 ppm
<u>VEGETATION</u>			
Lind Place tomato	07/26/84	84-1460	9.8 ppb
Lind Place cucumber	07/26/84	84-1462	14. ppb
Lind Place banana pepper	07/26/84	84-1464	23. ppb
Lind Place squash	07/26/84	84-1466	28. ppb
Lind Place cucumber	07/27/84	84-1491	6.6 ppb
Lind Place tomato	07/27/84	84-1493	9.2 ppb
Lind Place pepper	07/27/84	84-1494	20. ppb
Lind Place bell pepper	07/27/84	84-1496	9.8 ppb
Lind Place squash	07/27/84	84-1497	10. ppb

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables	1-123 ppb
Soils	.01-4.7 ppm
Fresh Water	.02-.06 ppb

MERCURY DATA

Oak Hills-Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u>			
Newhaven Road surface	07/27/84	84-1499	.13 ppm
Newhaven Road surface	07/27/84	84-1500	.14 ppm
Newhaven Road surface	07/27/84	84-1501	.08 ppm
Newhaven Road surface	07/27/84	84-1502	.07 ppm
Newhaven Road surface	07/27/84	84-1503	.12 ppm

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables	1-123 ppb
Soils	.01-4.7 ppm
Fresh Water	.02-.06 ppb

MERCURY DATA

Outside of City Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u>			
Oklahoma City, Oklahoma surface	08/04/84	84-1504	-.01 ppm
Fort Collins, Colorado surface	08/10/84	84-1505	.01 ppm
Grand Junction, Colorado surface	08/10/84	84-1506	.04 ppm
Utah surface	08/11/84	84-1507	.03 ppm
Las Vegas, Nevada surface	08/11/84	84-1508	.02 ppm
Nevada surface	08/11/84	84-1509	.02 ppm
Nevada surface	08/11/84	84-1510	.01 ppm
Tucumcari, New Mexico surface	08/11/84	84-1513	.01 ppm

"-" in Results Column equals "<" or less than.

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables	1-123 ppb
Soils	.01-4.7 ppm
Fresh Water	.02-.06 ppb

MERCURY DATA

RobertsVille Area

LOCATION		DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u>				
Royce Circle		07/26/84	84-1468	3.4 ppm
Monticello Apts.	surface	07/26/84	84-1469	10. ppm
Royce Circle		07/26/84	84-1470	2.0 ppm
Monticello Apts.	surface	07/26/84	84-1471	1.2 ppm
Royce Circle		07/26/84	84-1472	.37 ppm
Monticello Apts.	surface	08/06/84	84-1537	.66 ppm
Royce Circle		08/07/84	84-1538	42. ppm
Monticello Apts.	surface	08/07/84	84-1539	41. ppm
Van Hicks Place		08/07/84	84-1540	.30 ppm
surface		08/07/84	84-1541	.16 ppm
Van Hicks Place		08/07/84	84-1542	.16 ppm
surface		08/07/84	84-1543	.16 ppm
Van Hicks Place		08/07/84	84-1544	.15 ppm
surface				

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables	1-123 ppb
Soils	.01-4.7 ppm
Fresh Water	.02-.06 ppb

August 31, 1984

MERCURY DATA

Scarboro Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u>			
Tusculum Drive surface	08/21/84	84-1512	.09 ppm
<u>VEGETATION</u>			
Tusculum Drive green pepper	08/21/84	84-1511	17. ppb

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables	1-123 ppb
Soils	.01-4.7 ppm
Fresh Water	.02-.06 ppb

August 31, 1984

MERCURY DATA

Wiltshire Estates Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SEDIMENT</u>			
O. R. Turnpike, Property 564 (63,40)	08/15/84	84-1581	110. ppm
<u>SOIL</u>			
O. R. Turnpike, Property 564 (20,60) surface	06/13/84	84-1200	2100. ppm
O. R. Turnpike, Property 564 (20,60) - 1 m west surface	08/03/84	84-1514	1200. ppm
O. R. Turnpike, Property 564 (20,60) - 0.5 m west surface	08/03/84	84-1515	2200. ppm
O. R. Turnpike, Property 564 (20,60) - 1 m east surface	08/03/84	84-1516	190. ppm
O. R. Turnpike, Property 564 (20,60) - 0.5 m east surface	08/03/84	84-1517	560. ppm
O. R. Turnpike, Property 564 (20,60) - 1 m south surface	08/03/84	84-1518	150. ppm
O. R. Turnpike, Property 564 (20,60) - 0.5 m south surface	08/03/84	84-1519	170. ppm
O. R. Turnpike, Property 564 (20,60) - 1 m north surface	08/03/84	84-1520	310. ppm
O. R. Turnpike, Property 564 (20,60) - 0.5 m north surface	08/03/84	84-1521	1900. ppm
O. R. Turnpike, Property 564 (20,60) - 1 m northeast surface	08/03/84	84-1522	1070. ppm
O. R. Turnpike, Property 564 (20,60) - 0.5 m northeast surface	08/03/84	84-1523	830. ppm
O. R. Turnpike, Property 564 (20,60) - 1 m southeast surface	08/03/84	84-1524	110. ppm
O. R. Turnpike, Property 564 (20,60) - 0.5 m southeast surface	08/03/84	84-1525	180. ppm
O. R. Turnpike, Property 564 (20,60) - 1 m southwest surface	08/03/84	84-1526	190. ppm
O. R. Turnpike, Property 564 (20,60) - 0.5 m southwest surface	08/03/84	84-1527	200. ppm
O. R. Turnpike, Property 564 (20,60) - 1 m northwest surface	08/03/84	84-1528	270. ppm
O. R. Turnpike, Property 564 (20,60) - 0.5 m northwest surface	08/03/84	84-1529	1700. ppm
O. R. Turnpike, Property 564 (40,180) surface	08/03/84	84-1530	110. ppm
O. R. Turnpike, Property 564 (31,200) surface	08/03/84	84-1531	180. ppm
O. R. Turnpike, Property 564 (40,200) surface	08/03/84	84-1532	170. ppm

MERCURY DATA

Wiltshire Estates Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u> (Continued)			
O. R. Turnpike, Property 564 (33,220) surface	08/03/84	84-1533	120. ppm
O. R. Turnpike, Property 564 (33,240) surface	08/03/84	84-1534	120. ppm
O. R. Turnpike, Property 564 (30,260) surface	08/03/84	84-1535	120. ppm
O. R. Turnpike, Property 564 (33,160) surface	08/06/84	84-1536	160. ppm
O. R. Turnpike, Property 564 (20,280) surface	08/08/84	84-1545	700. ppm
O. R. Turnpike, Property 564 (40,300) surface	08/08/84	84-1546	300. ppm
O. R. Turnpike, Property 564 (40,320) surface	08/08/84	84-1547	160. ppm
O. R. Turnpike, Property 564 (40,280) surface	08/08/84	84-1548	89. ppm
O. R. Turnpike, Property 564 (40,340) surface	08/08/84	84-1549	77. ppm
O. R. Turnpike, Property 564 (40,360) surface	08/08/84	84-1550	63. ppm
O. R. Turnpike, Property 564 (40,380) surface	08/08/84	84-1551	79. ppm
O. R. Turnpike, Property 564 (40,400) surface	08/09/84	84-1552	65. ppm
O. R. Turnpike, Property 564 (40,420) surface	08/09/84	84-1553	83. ppm
O. R. Turnpike, Property 564 (40,440) surface	08/09/84	84-1554	63. ppm
O. R. Turnpike, Property 564 (40,460) surface	08/09/84	84-1555	67. ppm
O. R. Turnpike, Property 564 (40,480) surface	08/09/84	84-1556	63. ppm
O. R. Turnpike, Property 564 (40,500) surface	08/09/84	84-1557	57. ppm
O. R. Turnpike, Property 564 (40,520) surface	08/09/84	84-1558	66. ppm
O. R. Turnpike, Property 564 (40,540) surface	08/09/84	84-1559	72. ppm
O. R. Turnpike, Property 564 (40,560) surface	08/09/84	84-1560	74. ppm
O. R. Turnpike, Property 564 (40,580) surface	08/09/84	84-1561	76. ppm
O. R. Turnpike, Property 564 (40,600) surface	08/10/84	84-1562	110. ppm
O. R. Turnpike, Property 564 (40,620) surface	08/10/84	84-1563	80. ppm

MERCURY DATA

Wiltshire Estates Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u> (Continued)			
O. R. Turnpike, Property 564 (40,640) surface	08/10/84	84-1564	170. ppm
O. R. Turnpike, Property 564 (40,650) surface	08/10/84	84-1565	150. ppm
O. R. Turnpike, Property 564 (60,0) surface	08/10/84	84-1566	190. ppm
O. R. Turnpike, Property 564 (81,0) surface	08/10/84	84-1567	38. ppm
O. R. Turnpike, Property 564 (85,0) surface	08/10/84	84-1568	1.1 ppm
O. R. Turnpike, Property 564 (60,20) surface	08/15/84	84-1575	140. ppm
O. R. Turnpike, Property 564 (80,20) surface	08/15/84	84-1576	19. ppm
O. R. Turnpike, Property 564 (43,20) surface	08/15/84	84-1578	1.4 ppm
O. R. Turnpike, Property 564 (60,40) surface	08/15/84	84-1579	110. ppm
O. R. Turnpike, Property 564 (49,40) surface	08/15/84	84-1580	140. ppm
O. R. Turnpike, Property 564 (80,40) surface	08/15/84	84-1582	10. ppm
O. R. Turnpike, Property 564 (84,40) surface	08/15/84	84-1583	26. ppm
O. R. Turnpike, Property 564 (60,51) surface	08/15/84	84-1584	110. ppm
O. R. Turnpike, Property 564 (68,60) surface	08/15/84	84-1585	150. ppm
O. R. Turnpike, Property 564 (48,60) surface	08/15/84	84-1586	190. ppm
O. R. Turnpike, Property 564 (60,60) surface	08/15/84	84-1587	270. ppm
O. R. Turnpike, Property 564 (80,60) surface	08/15/84	84-1588	100. ppm
O. R. Turnpike, Property 564 (99,60) surface	08/15/84	84-1589	9.3 ppm
O. R. Turnpike, Property 564 (80,80) surface	08/17/84	84-1590	220. ppm
O. R. Turnpike, Property 564 (69,80) surface	08/17/84	84-1591	160. ppm
O. R. Turnpike, Property 564 (100,80) surface	08/17/84	84-1592	370. ppm
O. R. Turnpike, Property 564 (109,80) surface	08/17/84	84-1593	.33 ppm
O. R. Turnpike, Property 564 (60,80) surface	08/21/84	84-1594	120. ppm

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MERCURY DATA

Wiltshire Estates Area

LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u> (Continued)			
O. R. Turnpike, Property 564 (80,100) surface	08/21/84	84-1595	100. ppm
O. R. Turnpike, Property 564 (63,100) surface	08/21/84	84-1596	150. ppm
O. R. Turnpike, Property 564 (100,100) surface	08/21/84	84-1597	17. ppm
O. R. Turnpike, Property 564 (111,100) surface	08/21/84	84-1598	2.7 ppm
O. R. Turnpike, Property 564 (80,120) surface	08/21/84	84-1599	96. ppm
O. R. Turnpike, Property 564 (60,120) surface	08/21/84	84-1600	120. ppm
O. R. Turnpike, Property 564 (100,120) surface	08/21/84	84-1601	54. ppm
O. R. Turnpike, Property 564 (120,120) surface	08/21/84	84-1602	3.3 ppm
O. R. Turnpike, Property 564 (123,120) surface	08/21/84	84-1603	1.6 ppm

VEGETATION

O. R. Turnpike, Property 564 (20,60) near - soladego foliage	08/23/84	84-1604	410. ppb
O. R. Turnpike, Property 564 (20,60) near - soladego roots	08/23/84	84-1605	260. ppb
O. R. Turnpike, Property 564 (20,60) near - sneezeweed-foliage	08/23/84	84-1606	240. ppb
O. R. Turnpike, Property 564 (20,60) near - misc. grasses	08/23/84	84-1607	510. ppb
O. R. Turnpike, Property 564 (20,60) near - violets-foliage	08/23/84	84-1608	220. ppb

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables	1-123 ppb
Soils	.01-4.7 ppm
Fresh Water	.02-.06 ppb

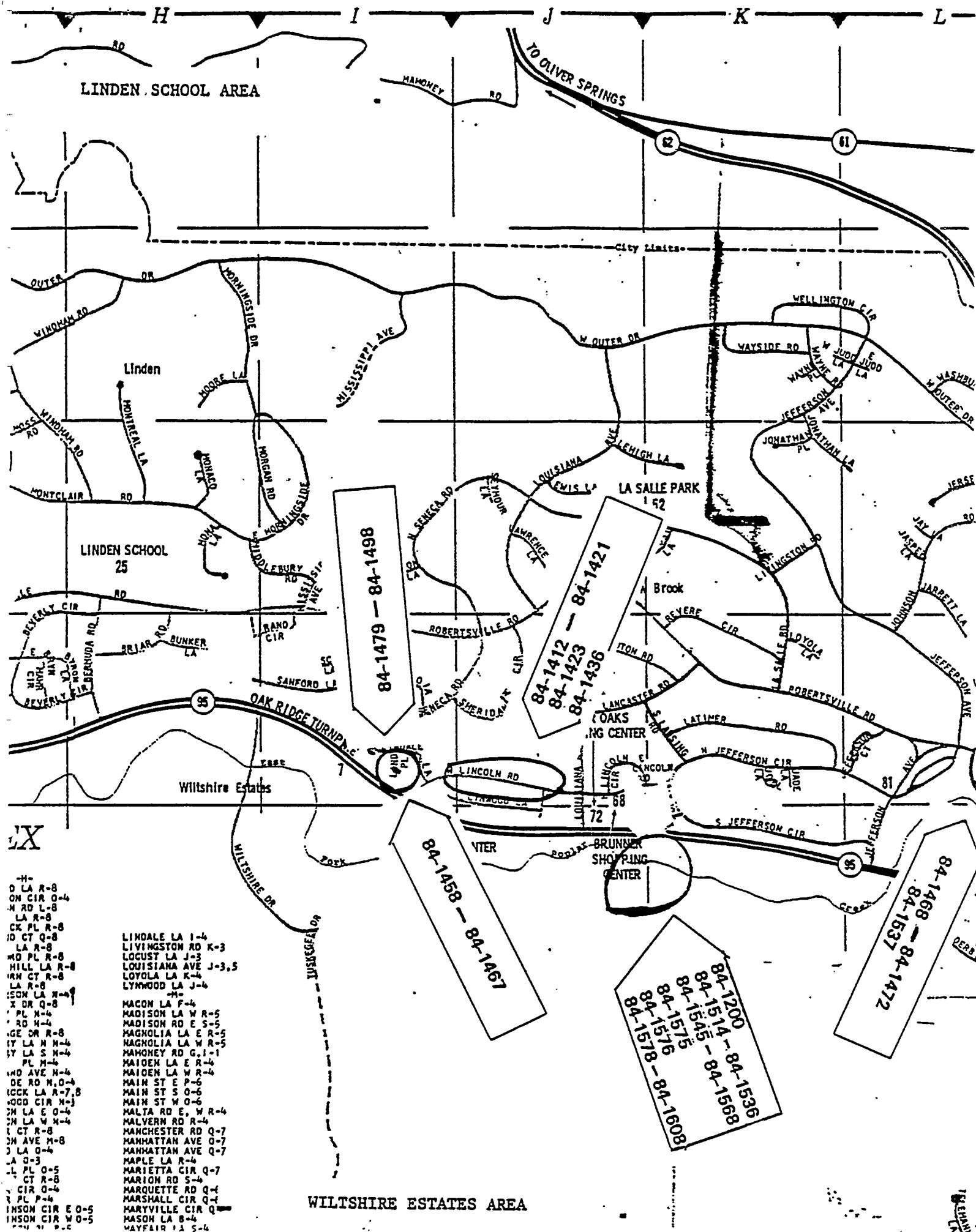
MERCURY DATA

Woodland Area

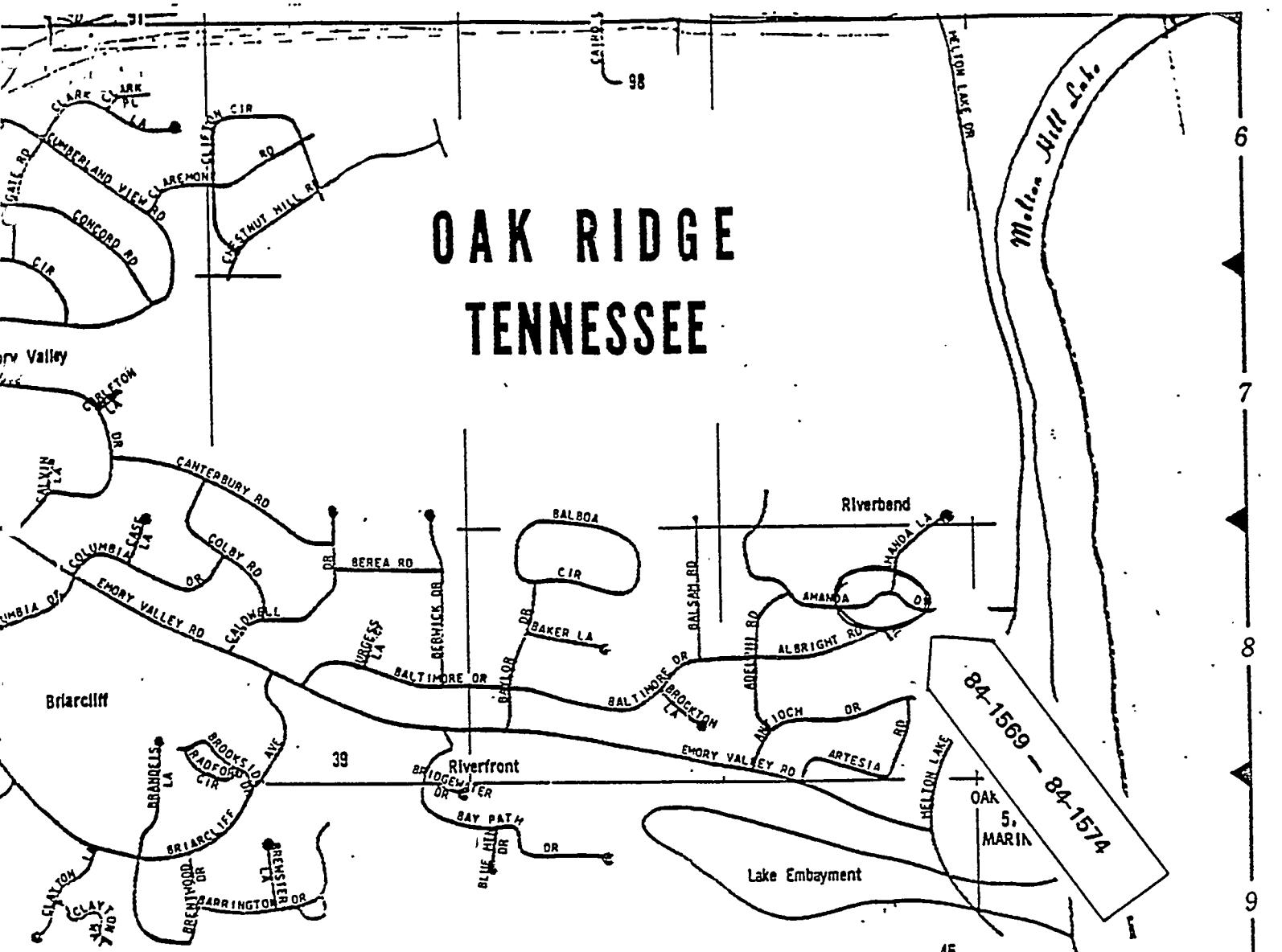
LOCATION	DATE COLLECTED	SAMPLE	RESULTS
<u>SOIL</u>			
North Purdue Avenue surface	07/26/84	84-1474	.12 ppm
North Purdue Avenue surface	07/26/84	84-1476	.12 ppm
North Purdue Avenue surface	07/26/84	84-1478	.12 ppm
<u>VEGETATION</u>			
North Purdue Avenue tomato	07/26/84	84-1473	16. ppb
North Purdue Avenue green pepper	07/26/84	84-1475	20. ppb
North Purdue Avenue cucumber	07/26/84	84-1477	14. ppb

Normal ranges according to the 1978 National Academy of Sciences report titled, "An Assessment of Mercury in the Environment", are:

Vegetables	1-123 ppb
Soils	.01-4.7 ppm
Fresh Water	.02-.06 ppb



OAK RIDGE TENNESSEE



FAIRBANKS ROAD AREA

- 103-Heliport S-6
- 104-Hospital R-5
- 106-Main Warehouse Area W-5
- 107-Midway Commercial Area Q-9
- 109-National Guard Armory L-5
- energy O-6 110-Nuclear Studies O-8
- 111-Reservoir R-3
- U. S. Dept. of Energy
- K25 Area A-8, 9
- X10 Area B-9
- Y12 Area C-9
- 112-Valley Industrial Park D-9
- 113-West Sewage Treatment Plant E-4

45
CHESTNUT RIDGE PARK

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Alamo, Texas 78516

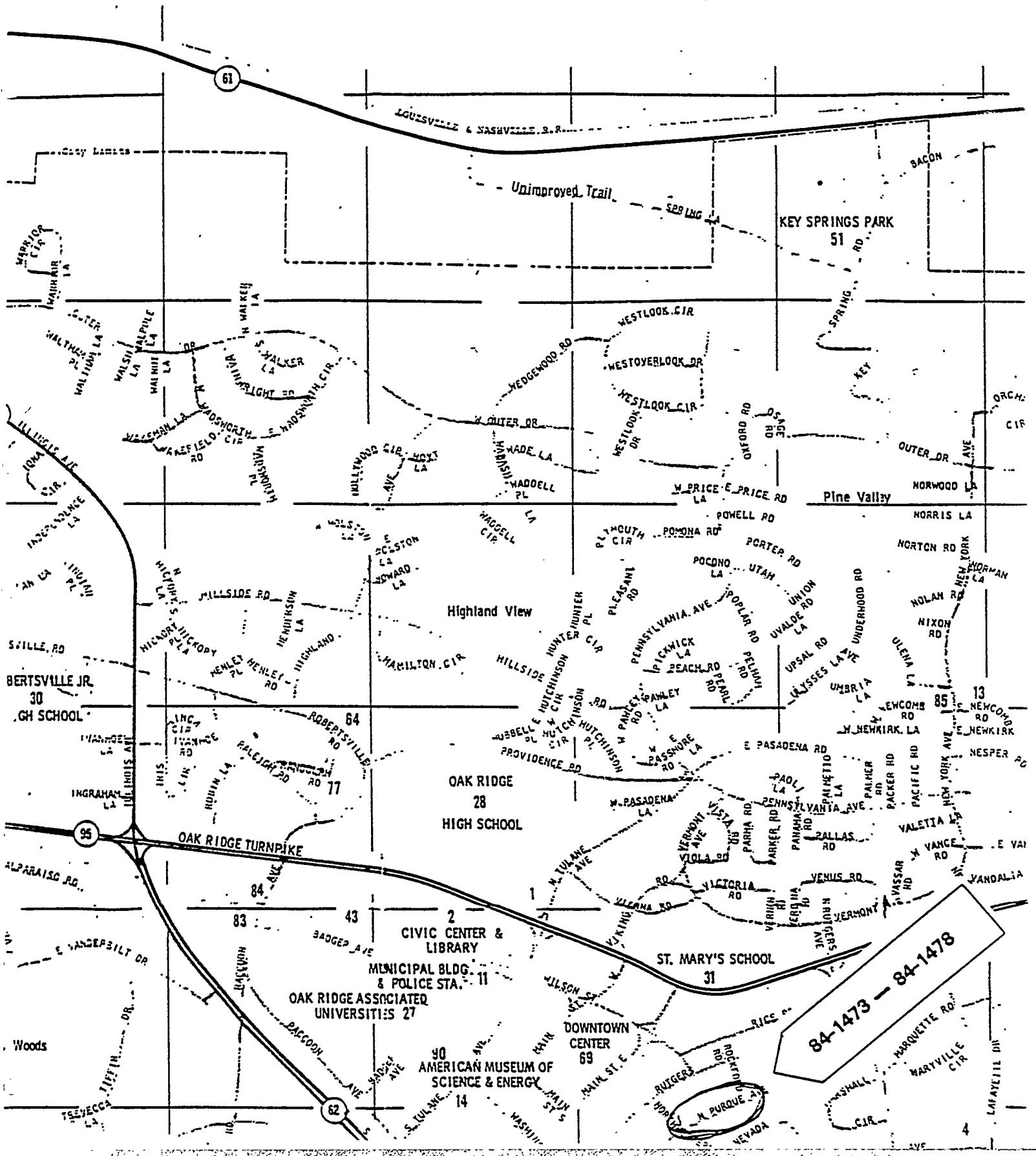
00-5-R1081

V — W — X — Y — Z

M N O P Q

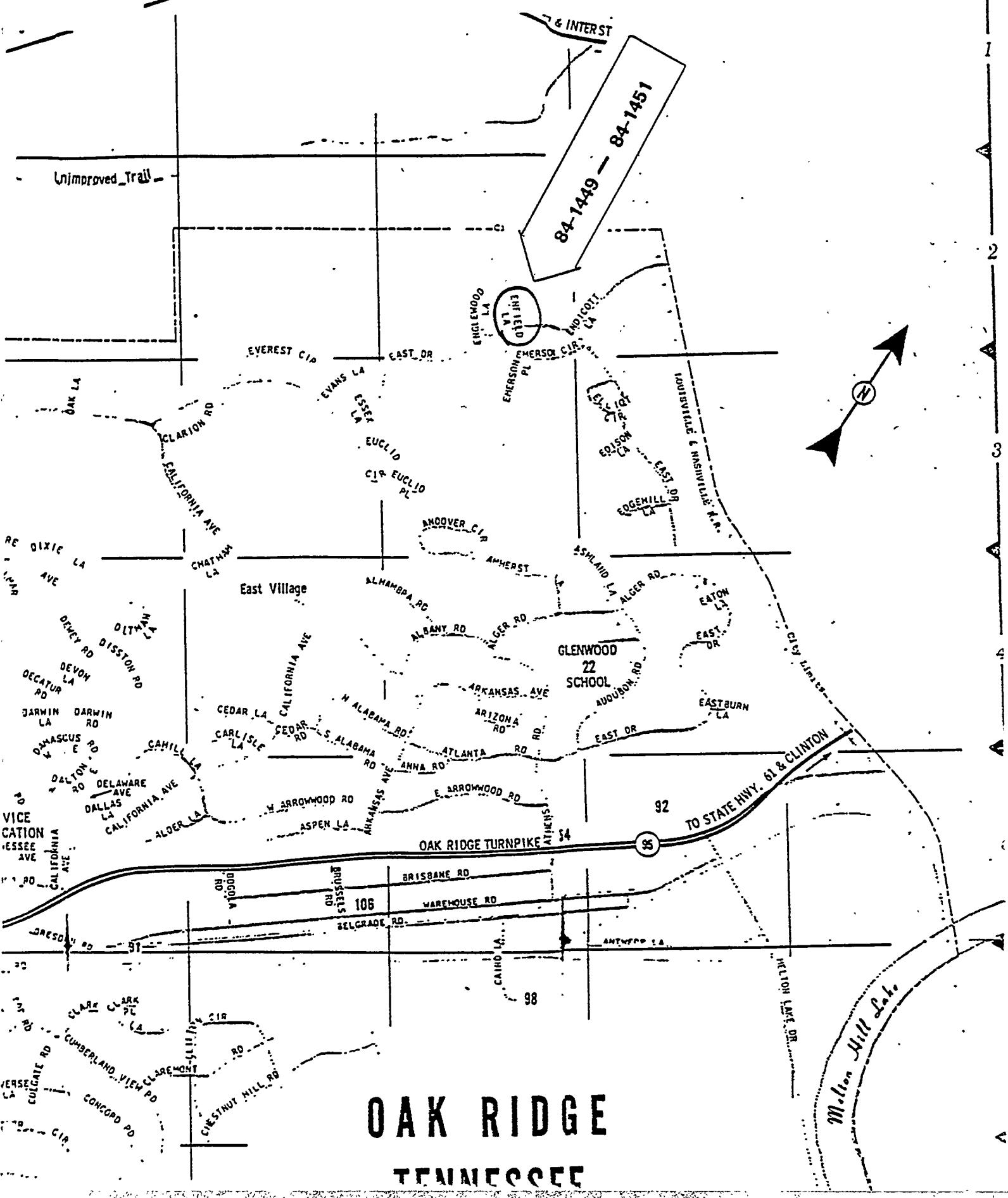
KITSVILLE AREA

HIGH SCHOOL AREA

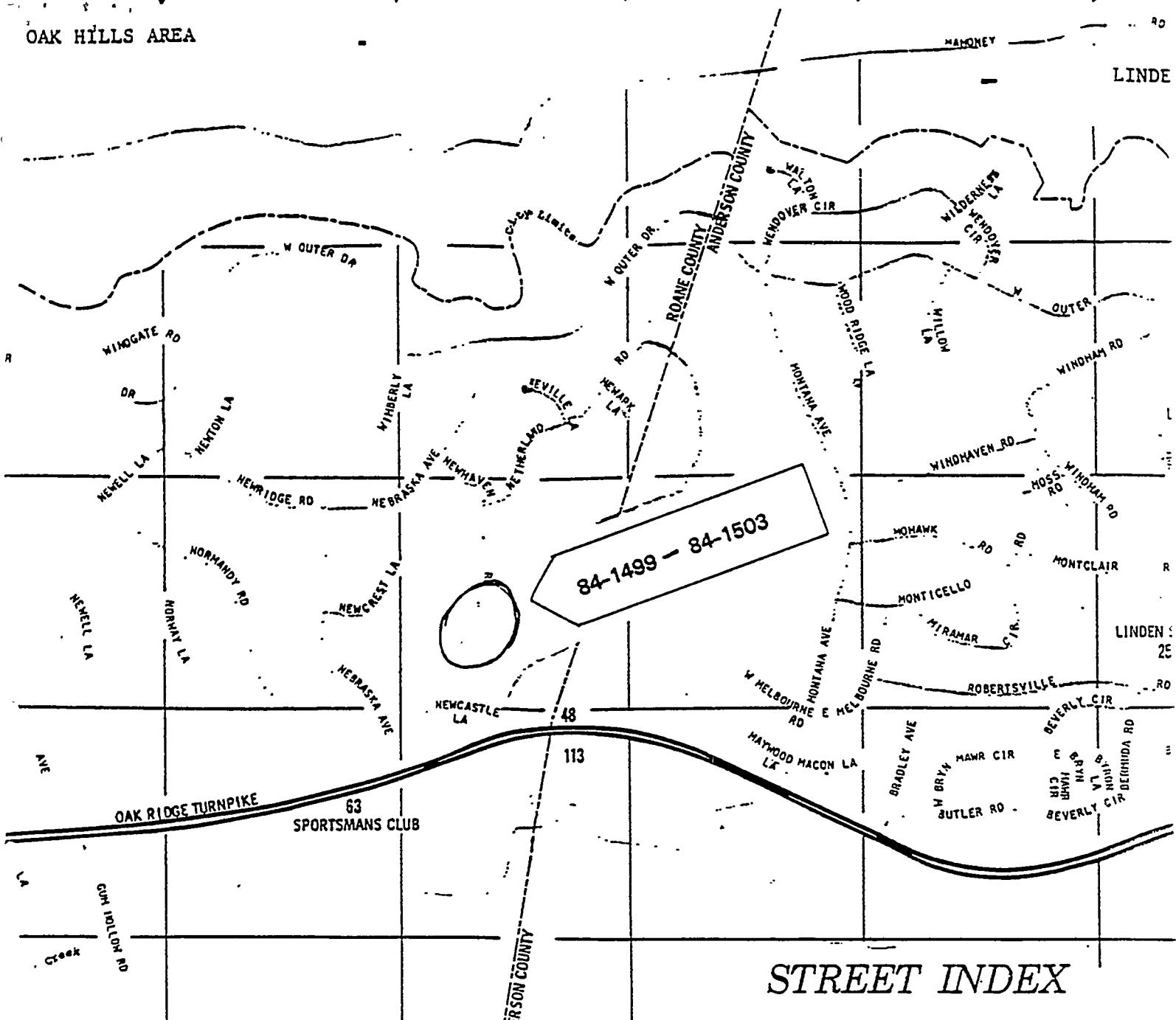


V W X Y Z

EAST VILLAGE AREA



OAK HILLS AREA



STREET INDEX

COUNTRY CLUB

55

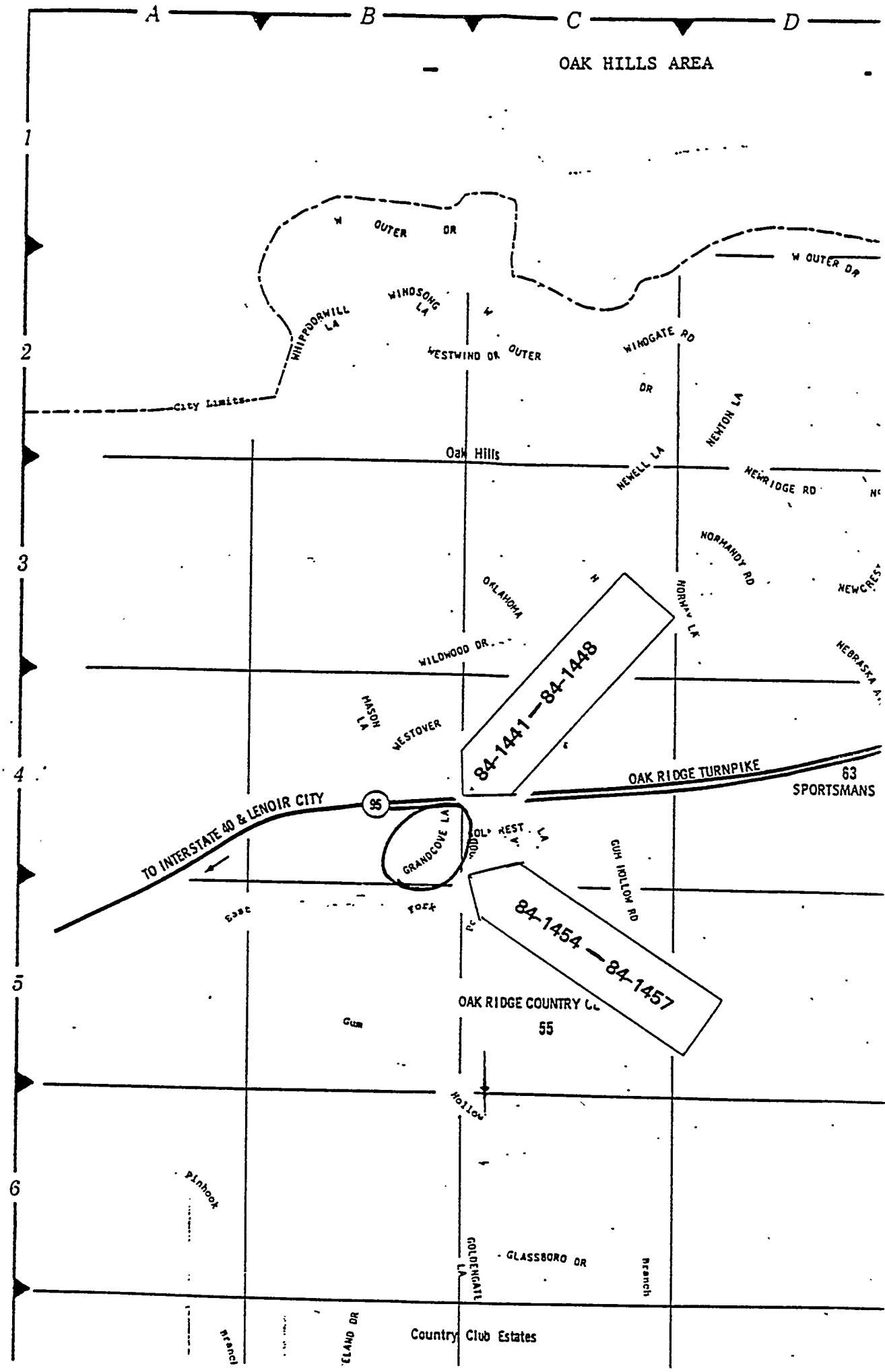
ISSBARD DR

Branch

ANDERSON COUNTY
ROANE COUNTY

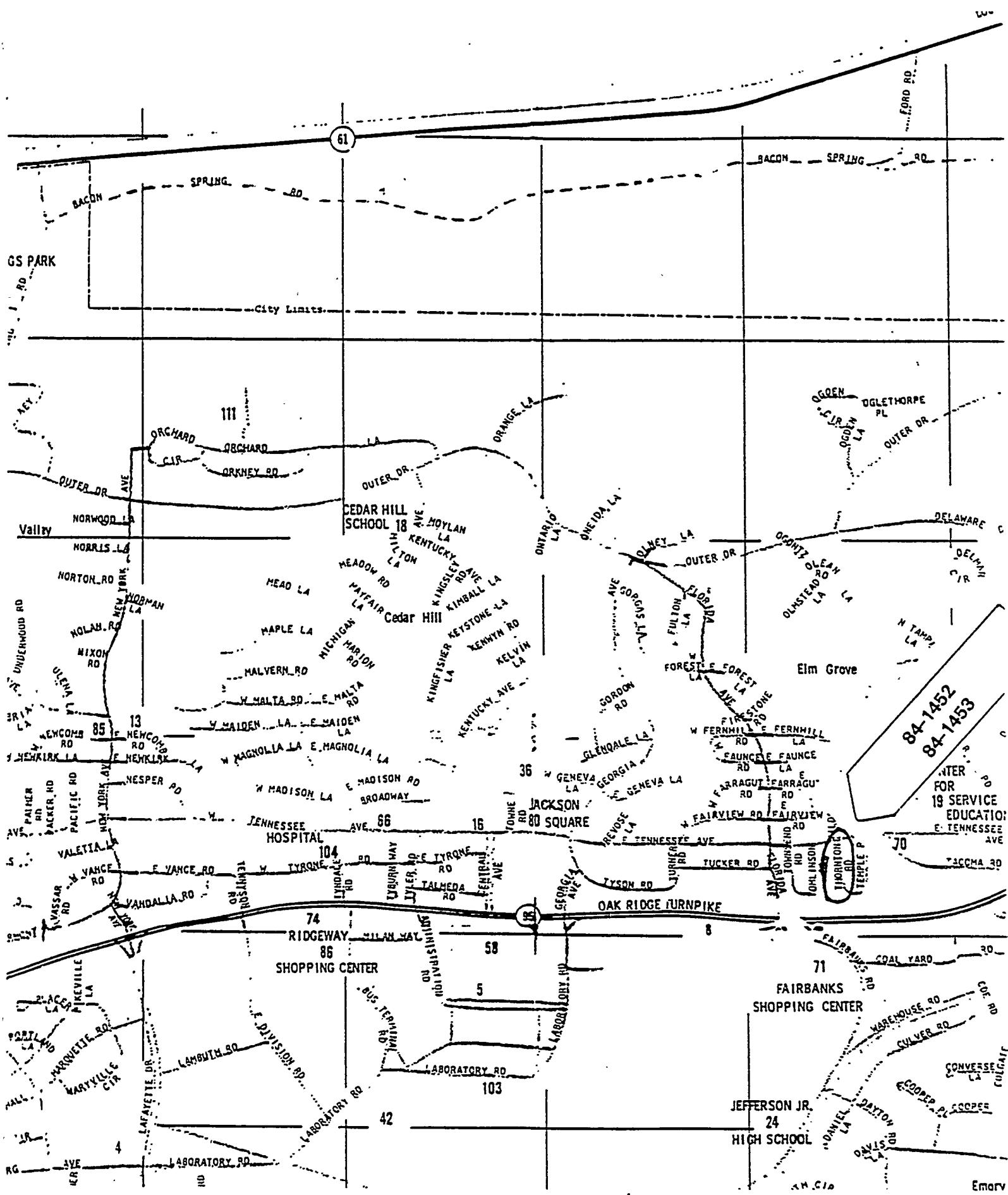
ADELPHI RD Y-8	COAL YARD RD U-6	HALSTED LA R-3
ADMINISTRATION RD S-5	COE RD V-6	HAMILTON CIR O-4
ALABAMA RD N W-4	COLBY RD W-8	HAMPTON RD L-3
ALABAMA RD S W-4	COLGATE RD V-6	HANDEL LA R-6
ALBANY RD X-4	COLUMBIA DR V-8	HARDWICK PL R-8
ALBION RD Y-8	COLUMBIA DR S V-8	HARLAND CT Q-8
ALBRIGHT RD Y-8	COMPTON LA U-8	HARPER LA R-8
ALDER LA V-5	CONCORD RD V-6	HARTFORD PL R-8
ALGER RD X-4	CONNORS CIR U-9	HAVEN HILL LA R-2
ALGER RD Y-4	CONNORS DR U-8	HAWTHORN CT R-8
ALHAMBRA RD W-4	CONNORS PL T-9	HEATH LA R-8
AMANDA DR Y-8	CONVERSE LA U-6	HENDERSON LA X-4
AMANDA LA Y-8	COOPER CIR V-6	HENDRIX DR Q-8
AMHERST LA X-4	COOPER PL U-6	HENLEY RD N-6
ANDOVER CIR X-3	CULVER RD U-6	HERITAGE DR R-8
ANNA RD X-5	CUMBERLAND VIEW RD V-6	HICKORY LA X N-4
ANTIOCH DR Y-8	DALLAS LA V-5	HICKORY LA S N-4
ANTWERP LA Y-5	DALTON RD E, W V-4	HICKORY PL M-4
ARIZONA RD X-4	DAMASCUS RD E, W V-4	HIGHLAND AVE N-4
ARKANSAS AVE W-5	DANA DR U-7	HILLSIDE RD N O-4
ARKANSAS AVE X-4	DANIEL LA U-7	HOLBROOK LA R-7, 5
ARROWWOOD RD E X-5	DARTMOUTH CIR U-7	HOLLYWOOD CIR N-3
ARROWWOOD RD W W-5	DARWIN LA V-4	HOLSTON LA E O-4
ARTESIA RD Y-8	DARWIN RD V-4	HOLSTON LA W N-4
ASHBURY LA Y-3	DAVIDSON LA U-7	HOPPER CT R-8
ASHLAND LA X-3	DAVIS LA U-7	HOUSTON AVE M-6
ASPEN LA W-5	DAYTON RD U-6	HOWARD LA C-4
ATHENS RD X-5	DECATUR RD V-4	HOYT LA O-3
ATLANTA RD X-4	DELAWARE AVE U-3	HUBBELL PL O-5
AUDUBON RD Y-4	DELAWARE AVE V-5	HUMBOLDT CT R-8
BACON SPRING RD Q-2	DELMAR CIR V-4	HUNTER CIR O-4
BACON SPRING RD U-2	DEVON LA V-4	HUNTER PL P-4
SADLER AVE H-6	DEWEY RD V-4	HUTCHINSON CIR E O-5
BAKER LA X-8	DILLARD AVE S L, M-8	HUTCHINSON CIR W O-5
BALBOA CIR X-7	DISSON RD V-4	HUTCHINSON PL P-5
BALSAM RD X-8	DITHIAN LA V-4	HUTTON LA R-8
	DIVISION RD E R-5, 6	

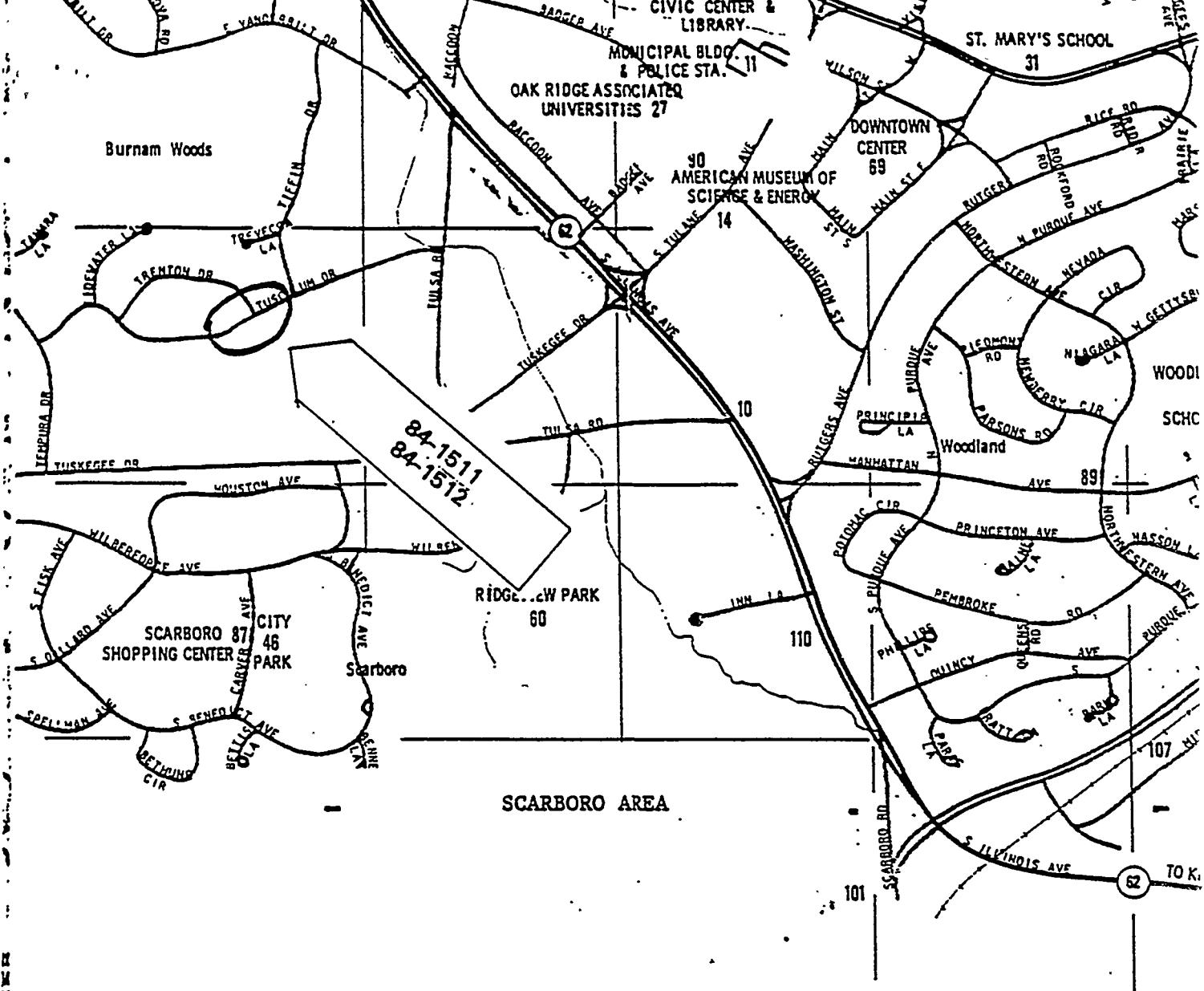
OAK HILLS AREA



CEDAR HILLS AREA

ELM GROVE AREA





SCARBORO AREA

M

N

O

P

M ————— N ————— O ————— P

ROBERTSVILLE AREA

HIGH SCHOOL AREA

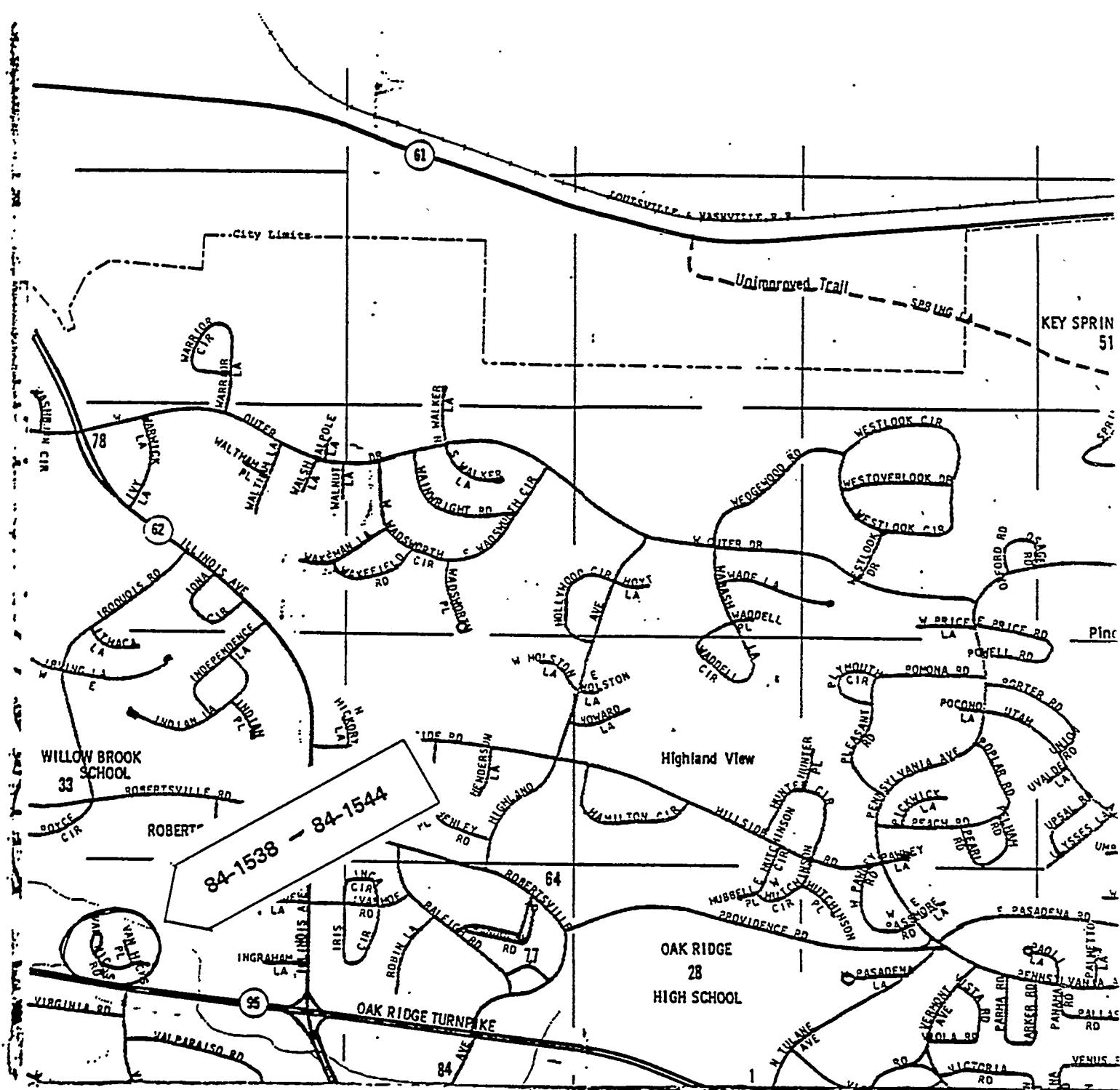


FIGURE 1

Decrease in Cs-137 and
Co-60 in the Sewage from the
Westend Waste Water Treatment Plant

CONTENT OF ^{60}Co (\circ) AND ^{60}Cr (Δ) IN SEWAGE SLUDGE
FROM OAK RIDGE WASTE WATER TREATMENT PLANT

LOG OF ACTIVITY

$$^{60}\text{Cr} = 0.22 \text{ C}^{\circ}000481$$

$$I = .935$$

$$^{60}\text{Co} = 27.32 \text{ C}^{\circ}00134$$

$$I = .88$$

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

TABLE 1

Radiation Monitoring of Emory
Valley Road Pump Station

RADIATION MONITORING OF EMMORY VALLEY ROAD PUMP STATION
 (SEQUENTIAL WATER SAMPLING)

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{134}Cs $\mu\text{ci}/\text{ml}$	Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{ci}/\text{ml}$	^{60}Co Bkg.	^{60}Co Cpm	^{60}Co Eff.	^{60}Co $\mu\text{ci}/\text{ml}$	
7-19-84	16:00	Bkg					Bkg							
7-20-84	09:00	Bkg					Bkg							
7-20-84	15:00	Bkg					Bkg							
7-25-84	16:00	Bkg					Bkg							
7-26-84	10:00	Bkg					Bkg							
7-26-84	16:00	Bkg					Bkg							
7-27-84	10:00	Bkg					Bkg							
7-27-84	15:00	Bkg					Bkg							
7-30-84	13:00	Bkg					Bkg							
7-31-84	10:00	Bkg					Bkg							
8-1-84	15:00	Bkg					Bkg							
8-1-84	12:00	Bkg					Bkg							
8-1-84	15:00	Bkg					Bkg							
8-2-84	10:00	Bkg					Bkg							
8-2-84	15:00	Bkg					Bkg							
8-3-84	08:00	Bkg					Bkg							
8-3-84	16:00	Bkg					Bkg							

RADIATION MONITORING OF EMMORY VALLEY ROAD PUMP STATION
 (SEQUENTIAL WATER SAMPLING)

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{134}Cs $\mu\text{ci}/\text{ml}$	^{137}Cs Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{ci}/\text{ml}$	^{60}Co Bkg.	^{60}Co Cpm	^{60}Co Eff.	^{60}Co $\mu\text{ci}/\text{ml}$
8-7-84	09:00									Bkg			
8-7-84	16:00									Bkg			
8-8-84	11:00									Bkg			
8-8-84	16:00									Bkg			
8-9-84	09:00									Bkg			
8-9-84	15:00									Bkg			
8-10-84	09:00									Bkg			
8-10-84	15:00									Bkg			

RADIATION MONITORING OF EMINY VALLEY ROAD PUMP STATION
 (SEQUENTIAL WATER SAMPLING)

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{134}Cs $\mu\text{ci}/\text{ml}$	Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{ci}/\text{ml}$	^{60}Co Bkg.	^{60}Co Cpm	^{60}Co Eff.	^{60}Co $\mu\text{ci}/\text{ml}$	
8-14-84	09:00	Bkg					Bkg			Bkg				
8-14-84	10:00	Bkg					Bkg			Bkg				
8-14-84	11:00	Bkg					Bkg			Bkg				
8-14-84	12:00	Bkg					Bkg			Bkg				
8-14-84	13:00	Bkg					Bkg			Bkg				
8-14-84	14:00	Bkg					Bkg			Bkg				
8-14-84	15:00	Bkg					Bkg			Bkg				
8-14-84	16:00	Bkg					Bkg			Bkg				
8-14-84	17:00	Bkg					Bkg			Bkg				
8-14-84	18:00	Bkg					Bkg			Bkg				
8-14-84	19:00	Bkg					Bkg			Bkg				
8-14-84	20:00	Bkg					Bkg			Bkg				
8-14-84	21:00	Bkg					Bkg			Bkg				
8-14-84	22:00	Bkg					Bkg			Bkg				
8-14-84	23:00	Bkg					Bkg			Bkg				
8-14-84	24:00	Bkg					Bkg			Bkg				
8-15-84	01:00	Bkg					Bkg			Bkg				
8-15-84	02:00	Bkg					Bkg			Bkg				

RADIATION MONITORING OF EMORY VALLEY ROAD PUMP STATION
 (SEQUENTIAL WATER SAMPLING)

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{134}Cs $\mu\text{ci}/\text{ml}$	^{137}Cs Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{ci}/\text{ml}$	^{60}Co Bkg.	^{60}Co Cpm	^{60}Co Eff.	^{60}Co $\mu\text{ci}/\text{ml}$
8-15-84	03:00	Bkg				Bkg				Bkg			
8-15-84	04:00	Bkg				Bkg				Bkg			
8-15-84	05:00	Bkg				Bkg				Bkg			
8-15-84	06:00	Bkg				Bkg				Bkg			
8-15-84	07:00	Bkg				Bkg				Bkg			
8-15-84	08:00	Bkg				Bkg				Bkg			
8-15-84	15:00	Bkg				Bkg				Bkg			
8-15-84	16:00	Bkg				Bkg				Bkg			
8-15-84	17:00	Bkg				Bkg				Bkg			
8-15-84	18:00	Bkg				Bkg				Bkg			
8-15-84	19:00	Bkg				Bkg				Bkg			
8-15-84	20:00	Bkg				Bkg				Bkg			
8-15-84	21:00	Bkg				Bkg				Bkg			
8-15-84	22:00	Bkg				Bkg				Bkg			
8-15-84	23:00	Bkg				Bkg				Bkg			
8-15-84	24:00	Bkg				Bkg				Bkg			

**RADIATION MONITORING OF EMMY VALLEY ROAD PUMP STATION
(SEQUENTIAL WATER SAMPLING)**

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{134}Cs $\mu\text{Ci}/\text{ml}$	^{137}Cs Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{Ci}/\text{ml}$	^{60}Co Bkg.	^{60}Co Cpm	^{60}Co Eff.	^{60}Co $\mu\text{Ci}/\text{ml}$
8-15-84	03:00	Bkg				Bkg				Bkg			
8-15-84	04:00	Bkg				Bkg				Bkg			
8-15-84	05:00	Bkg				Bkg				Bkg			
8-15-84	06:00	Bkg				Bkg				Bkg			
8-15-84	07:00	Bkg				Bkg				Bkg			
8-15-84	08:00	Bkg				Bkg				Bkg			
8-15-84	15:00	Bkg				Bkg				Bkg			
8-15-84	16:00	Bkg				Bkg				Bkg			
8-15-84	17:00	Bkg				Bkg				Bkg			
8-15-84	18:00	Bkg				Bkg				Bkg			
8-15-84	19:00	Bkg				Bkg				Bkg			
8-15-84	20:00	Bkg				Bkg				Bkg			
8-15-84	21:00	Bkg				Bkg				Bkg			
8-15-84	22:00	Bkg				Bkg				Bkg			
8-15-84	23:00	Bkg				Bkg				Bkg			
8-15-84	24:00	Bkg				Bkg				Bkg			

RADIATION MONITORING OF EMORY VALLEY ROAD PUMP STATION
 (SEQUENTIAL WATER SAMPLING)

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{134}Cs $\mu\text{ci}/\text{ml}$	Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{ci}/\text{ml}$	^{137}Cs Bkg.	^{60}Co Cpm	^{60}Co Eff.	^{60}Co $\mu\text{ci}/\text{ml}$	
8-16-84	02:00													
8-16-84	03:00	Bkg					Bkg							
8-16-84	04:00	Bkg					Bkg							
8-16-84	05:00	Bkg					Bkg							
8-16-84	06:00	Bkg					Bkg							
8-16-84	07:00	Bkg					Bkg							
8-16-84	08:00	Bkg					Bkg							
8-16-84	09:00	Bkg					Bkg							
8-16-84	10:00	Bkg					Bkg							
8-16-84	11:00	Bkg					Bkg							
8-16-84	12:00	Bkg					Bkg							
8-16-84	13:00	Bkg					Bkg							
8-16-84	14:00	Bkg					Bkg							
8-16-84	14:00	Bkg					Bkg							
8-16-84	15:00	Bkg					Bkg							
8-16-84	16:00	Bkg					Bkg							

7pm/1

RADIATION MONITORING OF EMORY VALLEY ROAD PUMP STATION
 (SEQUENTIAL WATER SAMPLING)

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{137}Cs $\mu\text{Ci}/\text{ml}$	^{137}Cs Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{Ci}/\text{ml}$	^{60}Co Bkg.	^{60}Co Cpm	^{60}Co Eff.	^{60}Co $\mu\text{Ci}/\text{ml}$
8-16-84	18:00	Bkg				Bkg				Bkg			
8-16-84	19:00	Bkg				Bkg				Bkg			
8-16-84	20:00	Bkg				Bkg				Bkg			
8-16-84	21:00	Bkg				Bkg				Bkg			
8-16-84	22:00	Bkg				Bkg				Bkg			
8-16-84	24:00	Bkg				Bkg				Bkg			
8-17-84	01:00	Bkg				Bkg				Bkg			
8-17-84	02:00	Bkg				Bkg				Bkg			
8-17-84	03:00	Bkg				Bkg				Bkg			
8-17-84	04:00	Bkg				Bkg				Bkg			
8-17-84	05:00	Bkg				Bkg				Bkg			
8-17-84	06:00	Bkg				Bkg				Bkg			
8-17-84	07:00	Bkg				Bkg				Bkg			
8-17-84	08:00	Bkg				Bkg				Bkg			
8-17-84	09:00	Bkg				Bkg				Bkg			
8-17-84	10:00	Bkg				Bkg				Bkg			
8-17-84	11:00	Bkg				Bkg				Bkg			

RADIATION MONITORING OF EMORY VALLEY ROAD
 (SEQUENTIAL WATER SAMPLING)

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{134}Cs $\mu\text{ci}/\text{ml}$	^{137}Cs Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{ci}/\text{ml}$	^{60}Co Bkg.	^{60}Co Cpm	^{60}Co Eff.	^{60}Co $\mu\text{ci}/\text{ml}$
8-17-84	13:00	Bkg.				Bkg.				Bkg.			
8-17-84	14:00	Bkg.				Bkg.				Bkg.			
8-17-84	15:00	Bkg.				Bkg.				Bkg.			
8-17-84	16:00	Bkg.				Bkg.				Bkg.			
8-17-84	17:00	Bkg.				Bkg.				Bkg.			
8-17-84	18:00	Bkg.				Bkg.				Bkg.			
8-17-84	19:00	Bkg.				Bkg.				Bkg.			
8-17-84	20:00	Bkg.				Bkg.				Bkg.			
8-17-84	21:00	Bkg.				Bkg.				Bkg.			
8-17-84	22:00	Bkg.				Bkg.				Bkg.			
8-17-84	23:00	Bkg.				Bkg.				Bkg.			
8-17-84	24:00	Bkg.				Bkg.				Bkg.			
8-18-84	01:00	Bkg.				Bkg.				Bkg.			
8-18-84	02:00	Bkg.				Bkg.				Bkg.			
8-18-84	03:00	Bkg.				Bkg.				Bkg.			
8-18-84	04:00	Bkg.				Bkg.				Bkg.			

RADIATION MONITORING OF EMMORY VALLEY ROAD PUMP STATION
(SEQUENTIAL WATER SAMPLING)

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{134}Cs $\mu\text{Ci}/\text{ml}$	^{137}Cs Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{Ci}/\text{ml}$	^{137}Cs Bkg.	^{60}Co Cpm	^{60}Co Bkg.	^{60}Co Eff.	^{60}Co $\mu\text{Ci}/\text{ml}$
88-18-84	06:00	Bkg				Bkg				Bkg				
88-18-84	07:00	Bkg				Bkg				Bkg				
88-18-84	08:00	Bkg				Bkg				Bkg				
88-18-84	09:00	Bkg				Bkg				Bkg				
88-18-84	10:00	Bkg				Bkg				Bkg				
88-18-84	11:00	Bkg				Bkg				Bkg				
88-18-84	12:00	Bkg				Bkg				Bkg				
88-18-84	13:00	Bkg				Bkg				Bkg				
88-21-84	12:00	Bkg				Bkg				Bkg				
88-21-84	13:00	Bkg				Bkg				Bkg				
88-21-84	14:00	Bkg				Bkg				Bkg				
88-21-84	15:00	Bkg				Bkg				Bkg				
88-21-84	16:00	Bkg				Bkg				Bkg				
88-21-84	17:00	Bkg				Bkg				Bkg				
88-21-84	18:00	Bkg				Bkg				Bkg				
88-21-84	19:00	Bkg				Bkg				Bkg				
88-22-84	20:00	Bkg				Bkg				Bkg				
88-22-84	12:00	Bkg				Bkg				Bkg				

RADIATION MONITORING OF EMMY VALLEY ROAD PUMP STATION
 (SEQUENTIAL WATER SAMPLING)

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{134}Cs $\mu\text{ci}/\text{ml}$	Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{ci}/\text{ml}$	^{60}Co Bkg.	^{60}Co Cpm	^{60}Co Eff.	^{60}Co $\mu\text{ci}/\text{ml}$	
88-21-84	21:00	Bkg				Bkg				Bkg				
88-21-84	22:00	Bkg				Bkg				Bkg				
88-21-84	23:00	Bkg				Bkg				Bkg				
88-21-84	24:00	Bkg				Bkg				Bkg				
88-22-84	01:00	Bkg				Bkg				Bkg				
88-22-84	02:00	Bkg				Bkg				Bkg				
88-22-84	03:00	Bkg				Bkg				Bkg				
88-22-84	04:00	Bkg				Bkg				Bkg				
88-22-84	05:00	Bkg				Bkg				Bkg				
88-22-84	06:00	Bkg				Bkg				Bkg				
88-22-84	07:00	Bkg				Bkg				Bkg				
88-22-84	08:00	Bkg				Bkg				Bkg				
88-22-84	09:00	Bkg				Bkg				Bkg				
88-22-84	10:00	Bkg				Bkg				Bkg				
88-22-84	11:00	Bkg				Bkg				Bkg				
88-22-84	12:00	Bkg				Bkg				Bkg				

**RADIATION MONITORING OF EMMY VALLEY ROAD PUMP STATION
(SEQUENTIAL WATER SAMPLING)**

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{134}Cs $\mu\text{ci}/\text{ml}$	^{137}Cs Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{ci}/\text{ml}$	^{60}Co Bkg.	^{60}Co Cpm	^{60}Co Eff.	^{60}Co $\mu\text{ci}/\text{ml}$
8-22-84	14:00	Bkg				Bkg				Bkg			
8-22-84	15:00	Bkg				Bkg				Bkg			
8-22-84	16:00	Bkg				Bkg				Bkg			
8-22-84	17:00	Bkg				Bkg				Bkg			
8-22-84	18:00	Bkg				Bkg				Bkg			
8-22-84	19:00	Bkg				Bkg				Bkg			
8-22-84	20:00	Bkg				Bkg				Bkg			
8-22-84	21:00	Bkg				Bkg				Bkg			
8-22-84	22:00	Bkg				Bkg				Bkg			
8-22-84	23:00	Bkg				Bkg				Bkg			
8-22-84	24:00	Bkg				Bkg				Bkg			
8-23-84	01:00	Bkg				Bkg				Bkg			
8-23-84	02:00	Bkg				Bkg				Bkg			
8-23-84	03:00	Bkg				Bkg				Bkg			
8-23-84	04:00	Bkg				Bkg				Bkg			
8-23-84	05:00	Bkg				Bkg				Bkg			
8-23-84	06:00	Rkg				Rkg				Rkg			

RADIATION MONITORING OF EMMY VALLEY ROAD PUMP STATION
(SEQUENTIAL WATER SAMPLING)

RADIATION MONITORING OF EMMORY VALLEY ROAD PUMP STATION
 (SEQUENTIAL WATER SAMPLING)

Date	Time	^{134}Cs Bkg.	^{134}Cs Cpm	^{134}Cs Eff.	^{134}Cs $\mu\text{ci}/\text{ml}$	^{137}Cs Bkg.	^{137}Cs Cpm	^{137}Cs Eff.	^{137}Cs $\mu\text{ci}/\text{ml}$	^{137}Cs Bkg.	^{60}Co Cpm	^{60}Co Eff.	^{60}Co $\mu\text{ci}/\text{ml}$
8-24-84	20:00	Bkg				Bkg				Bkg			
8-24-84	21:00	Bkg				Bkg				Bkg			
8-24-84	22:00	Bkg				Bkg				Bkg			
8-24-84	23:00	Bkg				Bkg				Bkg			
8-24-84	24:00	Bkg				Bkg				Bkg			
8-25-84	01:00	Bkg				Bkg				Bkg			
8-25-84	02:00	Bkg				Bkg				Bkg			
8-25-84	03:00	Bkg				Bkg				Bkg			
8-25-84	04:00	Bkg				Bkg				Bkg			
8-25-84	05:00	Bkg				Bkg				Bkg			
8-25-84	06:00	Bkg				Bkg				Bkg			
8-25-84	07:00	Bkg				Bkg				Bkg			
8-25-84	08:00	Bkg				Bkg				Bkg			
8-25-84	09:00	Bkg				Bkg				Bkg			
8-25-84	10:00	Bkg				Bkg				Bkg			
8-25-84	11:00	Bkg				Bkg				Bkg			
8-25-84	12:00	Bkg				Bkg				Bkg			

RADIATION MONITORING OF EMMY VALLEY ROAD PUMP STATION
(SEQUENTIAL WATER SAMPLING)

**RADIATION MONITORING OF EMMY VALLEY ROAD PUMP STATION
(SEQUENTIAL WATER SAMPLING)**

TABLE 2

Multi-element Analysis of Dried
Sludge from the Westend Waste
Water Treatment Facility

Dried Sewage Sl.*

Sample West Oak Ridge Plant

ANALYSIS REPORT

Log No. 84-1348D

Date 8/21/84

Submitted by C. Gist

Results in PPM Unless Otherwise Noted

By G. Gleason

Element	NAA	XRF	AA		Element	NAA	XRF	AA
F					Sn			
Na	1400± 80				Sb	7.0±0.5		
Mg (%)	1.2±0.1				Te			
Al (%)	2.9±0.2				I	57± 7		
Si					Cs	3.8±0.4		
P					Ba	1200±100		
S					La	17± .1		
C1	990±140				Ce	80± 5		
K	7300±400				Pr			
Ca (%)		3.7			Nd			
Sc	2.9±0.2				Sm			
Ti	4500±500	4400			Eu	1.0±0.1		
V					Gd			
Cr	960± 60	1700			Tb			
Mn	1650±100				Dy	-3.0±0.6		
Fe (%)	2.2±0.1	3.5			Ho			
Co					Er			
Ni		120			Tm			
Cu	1300±120	2500			Yb			
Zn	3060±200	5300			Lu			
Ga	7.4±0.7				Hf	4.8±0.3		
Ge					Ta	1.2±0.2		
As	3.9±0.3				W	4.6±0.4		
Se	11± 2				Re			
Br	67± 4				Os			
Rb					Ir			
Sr		220			Pt			
Y					Au	1.1±0.1		
Zr		320			Hg	12± 1		15
Nb					Tl			
Mo					Pb			45 ± 2
Ru					Bi			
Rh					Th	3.4±0.3		
Pd					U	62± 4		
Ag	190±10							
Cd			5.1±0.3					
In								

Sludge was 3.6% solids

TABLE 3

**Soil Multi-element Analysis for
Property 564 on East Fork Poplar
Creek Floodplain**

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August 31, 1984

Soil Multi-element Analysis for Property 564
on East Fork Poplar Creek Floodplain

Log. No.	Hg ppm	U ppm	Th ppm	Ba ppm	Cr ppm	As ppm	Se ppm	Cd(1) ppm	Ag ppm	Pb(1) ppm	Be(1) ppm
84-0866	210 ± 10	31 ± 2	24 ± 2	650 ± 60	78 ± 5	6.9 ± 0.4	<2	7.6 ± 0.5	6.1 ± 1.0	70	1.6
84-0868	250	43 ± 3	27 ± 2	790 ± 70	97 ± 6	8.3 ± 0.5	<2	8.4 ± 0.5	10 ± 1	80	1.8
84-0869	220	42 ± 3	25 ± 2	480 ± 60	91 ± 6	8.4 ± 0.5	<2	8.8 ± 0.5	11 ± 1	100	2.0
84-0871	250	35 ± 2	25 ± 2	450 ± 60	91 ± 6	7.3 ± 0.5	<2	7.7 ± 0.5	11 ± 1	90	2.3
84-0877	210	36 ± 2	21 ± 1	430 ± 50	91 ± 6	7.6 ± 0.5	<2	7.5 ± 0.5	9.0 ± 1.0	80	2.2
84-1172	53 ± 3	10 ± 0.7	5.4 ± 0.3	200 ± 30	56 ± 4	5.6 ± 0.3	<1	5.5 ± 0.3	<1	75	1.0
84-1178	50	23 ± 2	16 ± 1	620 ± 70	73 ± 5	6.3 ± 0.4	<2	3.0 ± 0.2	4.8 ± 1.5	60	2.1
84-1199	270 ± 16	35 ± 2	29 ± 2	780 ± 80	100 ± 6	8.5 ± 0.5	4.3 ± 1.6	9.3 ± 0.5	12 ± 2	90	2.2
84-1200	2000 ± 100	130 ± 8	68 ± 4	1200 ± 100	110 ± 8	16 ± 1	<8	45 ± 2	27 ± 4	130	2.4
84-1201	2100	49 ± 3	29 ± 2	470 ± 60	120 ± 7	9.1 ± 0.6	<2	9.7 ± 0.5	14 ± 2	130	2.2
84-1202	250 ± 15	60 ± 4	34 ± 2	450 ± 60	155 ± 10	9.5 ± 0.6	<2	10 ± 1.0	17 ± 2	130	2.3
84-1205	220 ± 13	47 ± 3	25 ± 2	490 ± 60	95 ± 6	8.9 ± 0.6	4.2 ± 1.8	11 ± 1.0	12 ± 1	95	2.0
84-1206	200 ± 12	43 ± 3	26 ± 2	550 ± 70	100 ± 6	8.7 ± 0.5	<2	7.8 ± 0.4	11 ± 1	110	1.6
84-1245	450 ± 30	71 ± 4	48 ± 3	640 ± 80	200 ± 12	12 ± 1	3.9 ± 1.4	16 ± 1.0	18 ± 2	175	2.6
84-1246	600	40 ± 2	25 ± 2	550 ± 60	100 ± 6	8.1 ± 0.5	<2	6.9 ± 0.3	11 ± 1	100	2.2
84-1249	230	100 ± 6	55 ± 3	780 ± 80	160 ± 10	12 ± 1	<2	18 ± 1.0	21 ± 2	140	2.5

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Soil Multi-element Analysis for Property 564
on East Fork Poplar Creek Floodplain

Log. No.	Rg ppm	U ppm	Th ppm	Ba ppm	Cr ppm	As ppm	Se ppm	Cd(1) ppm	Ag ppm	Pb(1) ppm	Be(1) ppm
84-1250	200 ± 12	40 ± 2	23 ± 1	540 ± 70	80 ± 5	7.4 ± 0.5	<2	7.2 ± 0.4	8.4 ± 1.2	80	2.0
84-1251	180 ± 13	32 ± 2	17 ± 1	550 ± 60	66 ± 4	7.3 ± 0.5	<2	6.7 ± 0.3	3.8 ± 1.0	75	1.6
	200										
84-1303	100 ± 6	36 ± 2	27 ± 2	700 ± 60	130 ± 8	9.4 ± 0.6	<2	9.0	15 ± 1	120	2.1
	120										
84-1304	88 ± 5	57 ± 3	27 ± 2	650 ± 74	150 ± 60	9.7 ± 0.6	<2	7.8	17 ± 2	130	2.0
	120										
Background Soils	<.05	4.5 ± 0.4	6.5 ± 0.4	200 ± 30	30 ± 5	5.0 ± 0.4	<3	<3	30		

Background
Soils

Where Rg sample has two sets of results, the latest results are listed first.

- (1) Determined by Atomic Absorption
All others by INAA

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Soil Multi-element Analysis for Property 564
on East Fork Poplar Creek Floodplain

Log No.	Gross α pCi/g	Gross β pCi/g
84-0866	9.8	32
84-0868	12	42
84-0869	11	37
84-0871	9.0	30
84-0877	9.4	31
84-1172	8.4	25
84-1178	6.4	34
84-1199	10	35
84-1200	20	73
84-1201	13	42
84-1202	15	47
84-1205	9.5	42
84-1206	9.6	31
84-1245	17	61
84-1246	13	32
84-1249	18	53
84-1250	9.0	29
84-1251	8.6	25
84-1303	12	40
84-1304	13	47

TABLE 4

**East Fork Poplar Creek Soil
and Plant Multi-element Analysis
and Concentration Factors**

August 31, 1984

EAST FORK POPLAR CREEK SOILS AND PLANTS^a
MULTI-METAL ANALYSIS AND CONCENTRATION FACTORS
(Results in ppm Unless Otherwise Noted)

ELEMENT	84-1049 SOIL	84-1050 BOX ELDRIDGE	CONCEN- TRATION FACTOR	84-1052 MONTY SUCKLE		CONCEN- TRATION FACTOR	84-1054 GRASS	CONCEN- TRATION FACTOR	84-1055 SOIL	CONCEN- TRATION FACTOR
				84-1031 SOIL	84-1033 ONION					
Mo	190 ± 11	<0.2	1.0 × 10 ⁻³	320 ± 20	<0.2	<0.1	<0.2	230 ± 14	1.3 ± 0.3	.01
U	95 ± 5	<0.1	1.0 × 10 ⁻³	80 ± 5	<0.1	<0.1	1.9 ± 0.2	200 ± 12	2.6 ± 0.2	.01
Na	600 ± 60	<7		700 ± 60	60 ± 5	.09	50 ± 5	.07	650 ± 70	41 ± 5
Cr	100 ± 6	<2		87 ± 6	5.4 ± 0.7	.06	2.7 ± 0.6	.03	93 ± 6	3.1 ± 0.9
As	12 ± 1	<0.1		14 ± 1	<0.1	<0.1	0.32 ± 0.5		11 ± 1	0.23 ± .05
Cd	4.4	<1.6		5.7	<2	2.9 ± 0.6	<2		7.8	<2.5
Ag	12 ± 1	<0.6		12 ± 1	<0.7	<0.6	<1.4		14 ± 1	<1
Se	6.1 ± 1.1	<1		<2	<0.9	<0.9	<2		4.4 ± 1.3	<2
Th	29 ± 2	<0.1		20 ± 1	<0.1	<0.07	<0.2		28 ± 2	<0.1
Pb	46			43			53			
Be	2.6			8.0			1.1			
Na	1370 ± 80	23 ± 1	.02	1300 ± 60	20 ± 1	.02	36 ± 2	.03	120 ± 7	.09
K (X)	1.9 ± 0.1	2.1 ± 0.1	1.1	1.6 ± 0.1	2.3 ± 0.1	1.44	1.2 ± 0.1	.75	1.6 ± 0.1	1.6 ± 0.3
Cl		530 ± 30			240 ± 20		1130 ± 70		1150 ± 70	2200 ± 130
Ma	750 ± 40	26 ± 2	.03	630 ± 40	50 ± 3	.08	12 ± 1	.02	80 ± 5	940 ± 60
Fe (X)	6.1 ± 0.3			7.3 ± 0.4					6.7 ± 0.4	6.7 ± 0.4
Zn	180 ± 13			160 ± 12	43 ± 5	.27	40 ± 4	.25	190 ± 14	.55 ± .8
Br	5.6 ± 0.5	3.7 ± 0.3	1.5	3.7 ± 0.3	4.7 ± 0.3	1.27	1.0 ± 0.1	.60 ± 0.4	7.7 ± 0.6	5.3 ± 0.3
Rb	91 ± 9			85 ± 7			6.3 ± 1.6	.27	72 ± 7	.69
Sr	110				30 ± 3			23 ± 6	170	17 ± 5
No								20 ± 2		23 ± 3
Ca	130 ± 8						115 ± 7		120 ± 7	
La	42 ± 3	0.08 ± 0.02	.01		38 ± 2		40 ± 2	0.50 ± 0.4	40 ± 2	.01
W	11 ± 1						9.5 ± 0.6		10.4 ± 0.7	.03
Al	0.07						0.03	0.05	0.01	.20

^aPlant tissue air dried at room temperature.

TABLE 5

**Comparison of East Fork Poplar Creek Floodplain
Sediment Analysis Performed by
ORAU and TVA**

Comparison of East Fork Poplar Creek Floodplain
Sedimentl Analysis Performed by ORAU and TVA
(Mercury)

Sample #	Depth (inches)	<u>ORAU2</u>			<u>TVA</u>	
		XRF ³ (ppm)	NAA ⁴ (ppm)	VAA ⁵ (ppm)	VAA ⁶ (63 μ) (ppm)	VAA ⁷ (500 μ) (ppm)
NF-1	0-7	210.	-	260.	320.	280.
NF-1	7-14	1400.	1300.	-	1100.	820.
NF-1	14-26	-	-	7.5	7.4	6.1
NF-1X	0-7	170.	-	190.	200.	170.
NF-1X	7-14	1100.	1070.	-	2000.	1400.
NF-1X	14-26	28.	-	41	46..	34.
NF-2S	0-10	250.	-	-	230.	250.
NF-2S	10-20	1800.	1600.	-	2000.	1800.
FF-2S	20-30	-	-	6.7	5.6	5.0
NF-1N	0-10	120.	-	140.	140.	94.
NF-1N	10-20	220.	-	300.	220.	190.
NF-2N	0-10	12.5	-	30.	30.	23.
NF-2N	10-18	9.6	-	4.3	5.7	5.3
NF-3N	Grab	5.9	-	29.	30.	26.

1. Sediments collected behind the Atmospheric Turbulence Diffusion Laboratory
2. Composite sample analysis - no particle size separation
3. Analysis by X-ray Fluorescence
4. Analysis by Neutron Activation Analysis
5. Analysis by Vapor Atomic Absorption
6. Soil particles passing through a 63 micron screen were analyzed
7. Soil particles passing through a 500 micron screen were analyzed

TABLE 6

Quality Assurance Comparisons of the
Analytical Results of Neutron Activation
and Vapor Atomic Absorption

ANALYTICAL QUALITY ASSURANCE

(Mercury)

Q.C. NUMBER	SAMPLE	WT(g)	NAA	VAA	TECH.	DATE
1	83-038-1	1.62	67.8	72	VP	6/27/83
2	83-038-2	1.66	75.6	64	VP	7/8/83
3	83-030-1	16.5	45.7	37	VP	7/21/83
	83-030-1		45.7	48	VP*	7/21/83
4	83-0048-1	2.09	36.7	40	SS	9/16/83
5	83-0049-1	1.73	42.7	47	SS	9/16/83
6	83-0099-1	15.0	140	130	SS	10/28/83
7	83-0181-1	14.5	88 \pm 6	86	SS	11/8/83
8	83-0163	16.8	50 \pm 3	55	SS	11/16/83
9	83-0027	16.1	2.4 \pm 0.3	2.7	SS	11/23/83
10	83-0049	17.1	50 \pm 4	58	SS	12/1/83
11	83-0400	17.1	18.4 \pm 1.1	21	SS	12/6/83
12	83-0256	20.0	5.8 \pm 0.5	6.8	SS	12/12/83
13	83-0179-2	1.635	416 \pm 30	390	SS	12/19/83
14	83-0733-1	17.0	285 \pm 17	280	SS	1/3/84
15	83-0736-1	19.4	120 \pm 7	130	SS	1/24/84
16	83-0735-1	17.7	240 \pm 15	250	SS	2/2/84
17	83-0739-1	18.7	170 \pm 10	170	SS	2/8/84
18	83-0764-1	19.2	120 \pm 7	120	SS	2/17/84
19	83-0767-1	19.6	100 \pm 6	100	SS	2/22/84
20	83-0740-1	18.3	210 \pm 12	190	SS	2/28/84
21	83-0768-1	19.6	125 \pm 7	100	SS	3/14/84
22	83-0738-1	18.4	190 \pm 12	210	SS	3/21/84
23	83-0036-1	-	15	12	SS	3/27/84
24	83-0983-1	18.3	150 \pm 10	130	SS	4/5/84
25	83-1295-1	20.2	110 \pm 7	100	SS	4/9/84
26	83-1223-1	19.4	115 \pm 7	120	SS	4/27/84
27	83-1293-1	18.4	210 \pm 12	220	SS	5/4/84
28	83-1296-1	18.0	250 \pm 15	260	VP	5/24/84
29	83-0036	-	12	11	VP	6/5/84
30	83-1037-1	18.3	105 \pm 7	92	VP	6/27/84

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ANALYTICAL QUALITY ASSURANCE

Q.C. NUMBER	SAMPLE	WT(g)	NAA	VAA	TECH.	DATE
31	83-1182-1	19.1	90 \pm 5	95	VP	7/11/84
32	83-0984-1	18.6	150 \pm 10	150	VP	8/1/84
33	83-1280-1	18.0	110 \pm 7	120	VP	8/7/84
34	83-986-1	18.1	100 \pm 7	100	SS	8/21/84

(*Using Aqua Regia Digest)

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August 31, 1984